

Health Information Systems and Health Communications: Narrowband and Broadband Technologies as Core Public Health Competencies

“The revolution in information systems and the efforts to take advantage of new opportunities are likely to alter the structure and function of schools of public health, the relationships among disciplines, and the health professions.”

Richard Riegelman, MD, MPH, PhD, and Nancy Alfred Persily, MPH

THE INFORMATION REVOLUTION

is affecting every aspect of health and medicine. The race to master the Web-based tools of distance education is just the beginning. We are being challenged to reexamine what we teach and how we organize what we teach in public health and health services education.

INFORMATION TECHNOLOGY AND PUBLIC HEALTH EDUCATION

It may be useful to think of information technology as di-

vided into 2 forms: narrowband and broadband. Narrowband technology is already revolutionizing the way we store, access, and use information. Text-only e-mail, the first-generation Internet, and many commonly-used health information databases can be regarded as narrowband technology. Broadband technologies are capable of full-range visual communication. They are now being built into the next-generation Internet, and the new DVD and similar technologies will soon allow Hollywood-quality videos to be available on home computers, making

communication of health messages by video as commonplace as e-mail is today. Other technologic advances enhance our ability to make business and clinical processing more efficient and effective while allowing individuals to work with large databases and adapt them to the changing needs of various population groups and communities.¹

In examining how these changes are reflected in public health education, we begin by focusing on the MPH degree and the core skills in health information systems and health

communications that should be required as part of the degree. The approach we take is based on 3 fundamental beliefs.

First, we believe that all MPH students must be introduced to the basic concepts of information management in public health practice and research and in health services management and research, including identification, evaluation, and use of health data. At a minimum, students must be comfortable with health information technology so that they can complement the core courses of epidemiology and biostatistics with exposure to tools and approaches practitioners and researchers need to access, evaluate, interpret, collate, reformat, and present relevant information for decision

continuous quality improvement, enhance learning, and allow organizations to focus on population health and future public health research as well as health care delivery.² Thus, information systems are the hub of health care delivery, both at the institutional level and at the public health or governmental level. Innovation in health information systems has occurred on a variety of fronts—clinical, health services research, financial, and epidemiologic. Future health care leaders will have to become more technology-savvy; they will have to know the right questions to ask, as well as the potential for future applications. In this rapidly changing health care environment, the use of multidisciplinary teams comfortable with technology to institute a broader

changing health attitudes and behavior, shaping social norms, changing the way health issues are portrayed by the popular media, and influencing decisions about legislation and policies.”⁷

The Council on Education for Public Health currently requires course work in social and behavioral science.⁵ However, there is an additional body of knowledge and skills all students must employ within the context of health education and promotion.⁸ Health communications represents an unprecedented potential for getting the word out, using print and broadcast media and disseminating positive messages through movies, sitcoms, soap operas, and even MTV.^{8,9} Health communications transforms scientific recommendations into message strategies relevant to the consumer—however that consumer is defined.⁷ Health information systems and health communications, then, are the ties that bind the disciplines of public health, health services, and clinical medicine.

It is critical to consider how health information systems and health communications can be integrated into the core MPH curriculum, made part of existing specialty curriculums, and developed into new specialty curriculums. Technology’s impact on how we deliver services and organize systems has just begun. As we examine the educational implications of new technology, we must consider how technology affects the lines between the disciplines of public health and between the traditional perspectives of public health, health services, and clinical medicine.

This commentary is based on the assumption that students who receive an MPH degree

from an accredited school or program should have the basic knowledge necessary to utilize the tools of the information age, both narrowband and broadband, and that public health graduates should be able to select a specialization in one of the traditional disciplines or in health information systems or health communications. The changes needed to incorporate health information systems and health communications into the curriculum of a school of public health are well under way at The George Washington University School of Public Health and Health Services (GW-SPHHS), and GW-SPHHS will be used as an example of one approach to accomplishing these goals.

To develop an approach to health information systems and health communications, GW-SPHHS put together a health information systems task force and a health communications task force. Each task force defined the key content in that area belonging in the core curriculum for all MPH students. In addition, the task forces examined the content of a curriculum that would allow students to gain a graduate certificate and eventually a master’s degree in health information systems or a master’s degree in health communications. As the first step in the process, all incoming MPH students, regardless of specialization, are required to take two 1-credit courses: one in health information systems and one in health communications. How has the core curriculum been defined, and how is it linked to specializations in health information systems and health communications? What is our approach to the development of specialty curriculums?

“Information systems are the hub of health care delivery.”

making. Second, all MPH students must increase their understanding of theories of health communications and apply these theories to the design and evaluation of health messages and interventions using media and skills appropriate to various audiences. Third, public health education in health information systems and health communications provides an essential linkage holding together the population perspective of public health, the institutional perspective of health services, and the individual perspective of clinical medicine.

Health information systems link organizations to the community, provide feedback for con-

application of information management will be crucial.^{3–5}

Recently, the Centers for Disease Control and Prevention (CDC) developed a comprehensive health communications database containing summaries of more than 200 articles about health communications research and practice. This database is consistent with the CDC’s definition of “health communications” as “the study and use of communication strategies to inform and influence individual and community decisions that enhance health.”⁶ The CDC, other governmental agencies, and private organizations and institutions have recognized that health communications provide “unique perspectives . . . on

TABLE 1—Objectives of the Health Information Systems Core Course: The George Washington University School of Public Health and Health Services, Washington, DC

Students who complete this course will have

- A basic understanding of principles, models, and processes for information systems and database management
- A basic understanding of the uses of data in public health practice and health administration
- Familiarity with the role of data standards for storage and transmission and awareness of existing standards
- An understanding of concepts of privacy and confidentiality and the role of policies and security in protecting them
- An awareness of possibilities for secondary use of management and administrative databases for public health and health services research, as well as strategies for preparing such data for statistical analysis to facilitate research while respecting privacy, confidentiality, and other legal requirements
- A basic understanding of the potential of the Internet for storage, transmission, and use of health data locally, nationally, and internationally
- Familiarity with appropriate roles and domains for informatics specialists, database programmers, epidemiologists and biostatisticians, managers, policymakers, researchers, and public health officials in information system development

CORE CURRICULUM

The objectives of the core MPH health information systems course (Table 1) are to introduce all MPH students to the current and potential applications of databases and to enhance the skills necessary to use databases. The initial required 1-credit course is designed to ensure basic skills and provide an overview of principles and advanced skills. Specific illustrations are presented to ensure the linkage between theory and practice. The required components of the health information systems core are

- Principles of utilizing the Internet and the World Wide Web,
- Principles of relational databases,
- Principles of linking and monitoring data,
- Principles of report generation,

- Principles of data presentation, and
- Principles of law and ethics relevant to securing and accessing data.

The initial required health communications course, like the health information systems

course, is an overview focusing on strategies, tactics, and principles, as well as fostering good oral and written communication skills. The objectives of the core health communications course (Table 2) are to introduce MPH students to current and potential uses of broadband technology and to enhance the skills needed to effectively utilize this technology, focusing on

- How we receive and process information, based on biological, psychologic, and neuroscience concepts;
- Effective presentation of messages, based on principles from communications theory, marketing, and psychology;
- Selection of communications media on the basis of experience and communications theory, marketing, and psychology; and
- Media production, based on experience and communications theory.

Additional time will be required to adequately cover these areas; thus, linking these re-

quired courses with existing coursework is an essential part of the process. The health information systems course will be linked with coursework in epidemiology, biostatistics, and management and policy. The health communications courses will be linked with coursework in health promotion and disease prevention, maternal and child health, and international health. All MPH students in these specializations will take additional “topics” courses in health information systems, health communications, or both, that are relevant to their concentration. The topics courses may be more focused on database management and reporting for epidemiology students, while students pursuing a management or policy concentration may focus on analyzing and integrating financial and clinical information and presenting data to various audiences.

The core course in health communications will be followed by more advanced communications coursework for students specializing in health promotion and disease prevention, maternal and child health, and international health. These courses provide more advanced communications skills and connect the study of health communications with principles and practices of behavioral change.

SPECIALTY CURRICULUMS

The development of specialty curriculums at GW-SPHHS has just begun, with an initial offering of a graduate certificate program in health information systems during the 2000–2001 academic year. Additional curriculums leading

TABLE 2—Objectives of the Health Communications Core Course: The George Washington University School of Public Health and Health Services, Washington, DC

Students who complete this course will

- Demonstrate knowledge and application of principles and models of health communication and the relationship between health communication and health policy
- Be able to select target audiences and appropriate channels of communication to reach those audiences
- Demonstrate oral and written skills in framing health communication messages
- Be able to recognize and apply good design principles and evaluation strategies for health communication practice
- Demonstrate an ability to communicate health risks and epidemiologic information to various target audiences

to master's degrees are being planned.

The 18-credit-hour graduate certificate program will emphasize database skills, including understanding the use of data in clinical, health services, and public health research and in management and policy.

Required coursework for the certificate program covers the following:

- Database management: using large databases for storage, retrieval, and reporting of data
- Data quality: methods for standardizing and ensuring the quality of data
- Web-based services: use of the Web to deliver services and data
- Health research literature: methods for critical evaluation of research data
- Organization of the health care delivery system
- Cost-effectiveness in health care
- Biostatistical and epidemiologic methods

For those who wish to pursue a management emphasis, coursework in project management, systems analysis, financial management, process improvement, and evidence-based management of care will be part of the master's curriculum. A research emphasis will include more advanced course work in statistical methods, use of SAS software (SAS Institute Inc, Cary, NC), and study design.

Health communications is both a new specialization and one grounded in traditional health education and health behavior. The new components build on coursework long taught in schools of communications, including radio, television, and film theory and pro-

duction. Thus, collaboration with a school of communications is essential. At GW-SPHHS, the George Washington University School of Media and Public Affairs teaches the communications courses, focusing—because it is located in Washington, DC—on political communications.

GW-SPHHS envisions a collaborative effort in which a health communications specialization will draw on coursework in communications, health education, and health behavior. Developing skills in social marketing and expertise in working with the media, assessing the audience, and preparing messages for mass media as well as specialized audiences are the goals of the health communications specialty curriculum.

This specialization is intended to provide students with a basic understanding of print as well as electronic media and how they can be used effectively to provide information, influence attitudes, and change behavior. Practice-based experiences and special projects will be the critical elements of a health communications specialization. Students will be placed in a variety of sites in the greater Washington area as well as within GW-SPHHS. For instance, GW-SPHHS is in the process of integrating the Institute for Mental Health Initiatives and its approaches into the GW-SPHHS health communications curriculum. The institute has developed a public health approach to promoting mental health by translating behavioral research findings into practical applications and fostering public dialogue through the public media and interme-

diaries such as writers, producers, and directors.

IMPACT ON SCHOOLS OF PUBLIC HEALTH

The revolution in information systems and the efforts to take advantage of new opportunities are likely to alter the structure and function of schools of public health, the relationships among disciplines, and the health professions. Traditional health professional education has been organized around disciplines centered in departments. These disciplines have, to a lesser or greater extent, contributed to the degrees offered by schools, which have brought together various disciplines to train professionals who see the world from a common perspective. Schools of medicine have focused on the individual perspective; schools of public health, on the population perspective; and business schools, on the institutional perspective.

Health information systems and health communications cut across department and school lines. At GW-SPHHS, the Departments of Epidemiology, Biostatistics, and Health Services Management and Policy, as well as Environmental and Occupational Health, have been interested and involved in the health information systems initiative. Health communications cuts across the domestic and international health behavior interests of the Departments of Prevention and Community Health and International Public Health and is also of interest to the Department of Environmental and Occupational Health and Health Services Management and Policy. The lines

within GW-SPHHS are clearly being crossed, and this, in and of itself, makes the initiative important and challenging.

The lines of separation between academic departments are not the only ones that are crossed by technology. Health information systems are just as important to managers of institutions and clinicians who use and access clinical data as they are to epidemiologists and environmental health specialists. Health communications techniques are important not only to public health professionals but also to institutional managers who wish to effectively communicate with clinicians and to clinicians who wish to effectively communicate with patients, other health care providers, and payers.

Technology is leading to a fundamental reexamination of the relationships between the individual perspective of clinical medicine, the institutional perspective of business and management, and the population or social perspective of public health. At GW-SPHHS, we have overtly linked the population perspective and the institutional perspective and called our school the School of Public Health and Health Services. The advantages of this approach are becoming evident as we look to new programs in health information systems, health policy, and long-term care that require both perspectives.

In the new information technology era, it is possible to envision the individual perspective represented by clinical medicine being linked to public health and to health services, not through subordination of public health in a school of medicine, but in an equal part-

nership in which the schools share ownership and responsibility for disciplines that cross school boundaries. Health information systems and health communications are just the tip of the iceberg, but as new and emerging areas, they are not a bad place to begin. ■

About the Authors

The authors are with the School of Public Health and Health Services, The George Washington University, Washington, DC.

Requests for reprints should be sent to Richard Riegelman, MD, MPH, PhD, The George Washington University School of Public Health and Health Ser-

vices, Ross Hall 106, 2300 Eye St NW, Washington, DC 20037 (e-mail: sphrkr@gwumc.edu).

This commentary was accepted January 9, 2001.

Contributors

R. Riegelman and N. A. Persily outlined the commentary together. R. Riegelman prepared a first draft, and N. A. Persily conducted a review of the literature and integrated the findings into that draft. Both authors prepared the final draft.

References

1. Stammer L. 9 Hot Technology Trends. *Healthcare Informatics*. 2000;17:46–70.
2. Persily N, Gottlieb J. *Reinventing the IDS: Moving Toward a 3-Dimensional Model for Integrating Healthcare*. Washington, DC: McGraw-Hill; 2000.
3. Morrissey J. 2020 visions. Just a click away. *Modern Healthcare*. 1999; 29(suppl):5–7.
4. Hupfeld S. 2020 visions. Hospitals—the next generation. *Modern Healthcare*. 1999;29(suppl):18–19, 22.
5. Kindig DA, Dunham NC, Eisenberg JM. Needs and challenges for health services research at academic health centers. *Acad Med*. 1999;74: 1193–1201.
6. Centers for Disease Control and Prevention. HealthComm key: unlocking the power of health communication research. Available at: <http://www.cdc.gov/od/oc/hcomm>. Accessed May 28, 2001.
7. Simons-Morton BG, Donohew L, Crump AD. Health communication in

the prevention of alcohol, tobacco, and drug use. *Health Educ Behav*. 1997;24:544–554.

8. Neame R. Privacy and security issues in a wide area health communications network. *Int J Biomed Comput*. 1996;43:123–127.
9. Sutton SM, Balch GI, Lefebvre RC. Strategic questions for consumer-based health communications. *Public Health Rep*. 1995;110:725–733.